

Field Services

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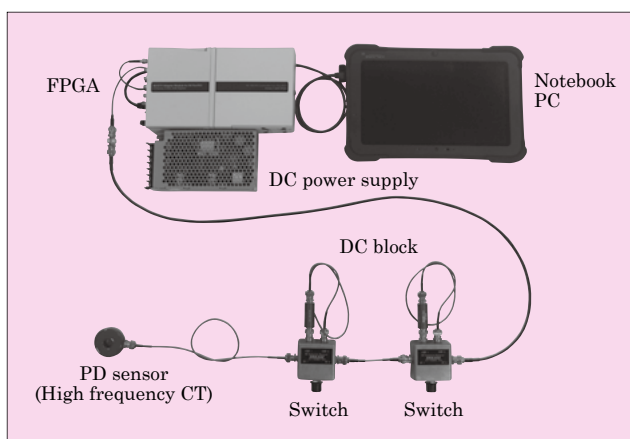
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1 Online Partial Discharge Measurement Device

Partial discharge measurement is used to check the health of medium-voltage switchboards. Although various measurement methods and measurement devices have been developed, none of them have had online capability.

Fuji Electric developed the online partial discharge measurement device as a device for constantly monitoring partial discharge to meet the need of long-term continuous operation of equipment. The prototype is composed of a PD sensor (high frequency CT) for detecting partial discharge signals, DC block and FPGA. The FPGA incorporates a logic that eliminates noise and extracts characteristic values (partial discharge phase and waveforms) from signals and then determines the existence of discharge generation. We plan to conduct prototype field verification and develop portable partial discharge detection devices, and using this technology, we will achieve IoT based partial discharge measurement systems.

Fig.1 Online partial discharge measurement device

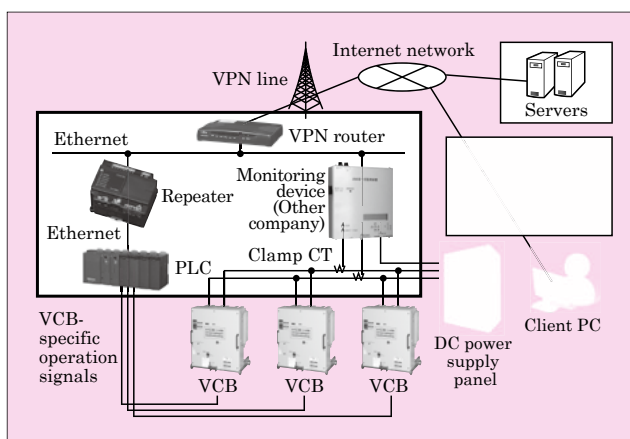


2 VCB Collective Monitoring System

The VCB collective monitoring system constantly and remotely monitors the operating current of vacuum circuit breakers (VCBs) that play an important role in power supply applications. A monitoring device is installed in the control power supply circuit of a VCB, and changes in current and time are automatically measured, transmitted and recorded to a cloud server via a VPN line. By accessing the server from a client PC, users can monitor, check and compare the current waveforms of any VCB. The main features are as follows:

- (1) A single monitoring device for acquiring data can be used to monitor multiple VCBs.
- (2) Capable of acquiring the operating characteristics of VCB closing and breaking.
- (3) Capable of comparing characteristics by tracing the acquired data.
- (4) Makes it possible to combine and identify the operating signals of individual VCB on the server.

Fig.2 Configuration of VCB collective monitoring system



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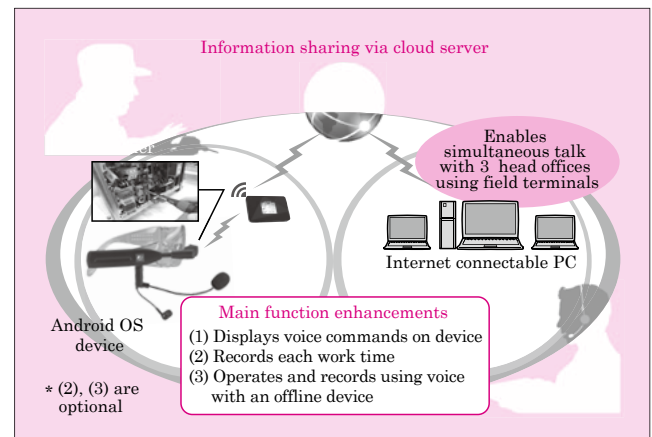
③ Functionality Expansion of “FWOSP” Wearable Remote Operation Support Package

The “FWOSP” Wearable Remote Operation Support Package is a cloud-based service that improves the quality and efficiency of work in the job field and support the transfer and accumulation of technical know-how.

Fuji Electric has expanded following operation and management functions by bidirectionally connecting the glass-type wearable device worn by workers to a PC located at the head office using voice and video: instructions, work support, voice input for recording pre-registered work procedures and work results. The main features are as follows:

- (1) Voice input commands are displayed as a list on the glass-type device to improve convenience at the job field and to achieve reliable voice operation.
- (2) FWOSP can be used for work time management by recording the work time on the server and confirming and downloading it via a PC in the head office.
- (3) The package comes equipped with a standalone function capable of recording results and displaying procedures by voice operation even when not connected to the Internet.

Fig.3 “FWOSP”





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